

Appl. No. 10/605,502
Reply to Office action of September 17, 2007

REMARKS/ARGUMENTS

Request for Continued Examination:

The applicant respectfully requests continued examination of the above-indicated
5 application as per 37 CFR 1.114.

Amendments to the Claims

Claims 1 and 16 are amended to state the processor operates “without polling for a
10 status of the key cells during a time period between any key cell being connected to the
first voltage and then connected to the second voltage.” Similarly, claims 7, 17, and 26 are
amended to state the processor “without polling for a status of the key cells during a time
period between any key cell being pressed and then released.” No new matter has been
introduced. In particular, applicant points to paragraph [0018], which notes the “present
15 invention solves the problem of the prior art that continuous polling is required whenever
any key cell is pressed (e.g. from time t_1 to t_4 in FIG.3), and thereby improves the
efficiency of the processor”. Regarding the patentability of amended claims 1, 7, 16, 17,
and 26, the applicant presents remarks pertaining to explaining how such feature is not
found in the cited prior arts, and also presents remarks explaining how such feature is
20 actually an unexpected result of the present invention different from the combination of
prior art teachings and should therefore not be found obvious, in paragraphs of the section
below. Claims 1, 7, 16, 17 and 26 are therefore presented to be in allowable state, and
Examiner consideration of the claims is respectfully requested.

Claim Rejections – 35 USC §103

25 **Claims 1, 7, and 16-22 as rejected in Office Action dated September 17, 2007.**

Applicant asserts that claims 1, 7, 16-22 should not be found unpatentable over
Schnizlein and Nakazawa for at least the reasons presented below.

Examiner remarks on page 3 of the Office Action dated September 17, 2007, that
30 “all of the component parts are known in Nakazawa and Schnizlein. The only difference

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is the combination of the 'old elements' into a single keyboard. Thus, it would have been obvious to a person of ordinary skill in the art to implement the parallel-to-serial register taught by Schnizlein into the keyboard of Nakazawa". The applicant again asserts there is lack of motivation to combine them into the present invention, as previously presented in
5 remarks (see response to Office Action dated June 22, 2007, pages 8-9), and thus would not have been obvious to a person of ordinary skill to do so.

Furthermore, as mentioned above, the independent claims 1, 7, 16, 17 and 26 have been amended to include a feature that polling is not performed by the processor during the time period that any key is pressed to when it is released. Applicant notes that this is
10 different in operation than the prior arts of record as Nakazawa specifically states in the abstract, "Contacts are scanned only when any key is depressed", and Schnizlein states in col 4, lines 38-42, "After successive scans of the closed keyswitch 16C, the debounce and validation logic 62 sends a signal to the converter 64 which in turn provides an encoded serial signal to an external device (not shown)." (emphasis added) In this way, applicant
15 asserts that neither of the cited references teach the claimed feature of the present invention of not polling during the time period from a key cell being pressed to released. The present invention is therefore different from the prior arts mentioned: detecting keypresses and key releases at the moment they are pressed or released without polling during the time period between a key cell being pressed and released. That is, the present
20 invention performs at-the-moment keypress and at-the-moment key release detection without a scanning operation, allowing the processor to free up resources that would otherwise be consumed by the scanning operation, further reducing power consumption of the keyboard or the computing device. Applicant notes that neither Nakazawa nor Schnizlein teach nor suggest such further improvements upon their inventions to achieve
25 this feature, as previously referenced (see response to Office Action dated June 22, 2007, pages 11-12). Nakazawa states (page 6, lines 5-7 from bottom) the "discrimination means 21, which is normally idle, starts scanning when a scanning initiation signal (h) is received. This scanning operation may be the same process as the conventional device" (emphases added), and Schnizlein is explicitly "a circuit for scanning a plurality of keyswitches"
30 (column 1, lines 45-49, emphasis added) and teaches "each of the keyswitches in the

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selected row are scanned. This column scanning process is repeated for each row" (column 3, lines 14-16, emphasis added). In paragraph [0005] of the present invention, a disadvantage of the prior art is explicitly stated: "the processor 14 needs to continuously poll the input signals ... until every key cell within the matrix key module 12 is released.

- 5 This continuous polling lowers the efficiency of the processor 14." Furthermore, the present invention solves this problem where "continuous polling is required whenever any key cell is pressed..., and thereby improves the efficiency of the processor" (paragraph [0018]).

- Moreover, applicant asserts that said missing feature would not be obvious to a
10 person of ordinary skill in the art without further inventive process because not requiring polling is actually an unexpected result of the structure of the present invention. As described above, all of the cited reference require polling of the keys during the time period between any key cell being pressed and then being released. A person skilled in the
15 art would not realize that the processor would no longer need to poll during this time period because the structures of the cited references specifically require polling to achieve particular goals, as was quoted above. Therefore, the unexpected result of the processor not polling the key cells of the present invention has a benefit that advantageously permits increasing the aforementioned efficiency of the processor because no polling by the
20 processor is required while keys are depressed, and additionally, further interpretation of user key behaviour such as the N-key rollover feature (which requires the ability to detect key presses and releases).

- The Federal Register Vol. 72, No. 195 includes "Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in KSR International Co. V. Teleflex Inc.". The applicant notes that section V. entitled
25 "Consideration of Applicant's Rebuttal Evidence" states that applicants may successfully overcome obviousness type rejections by demonstrating that "(3) the results of the claimed combination were unexpected." Concerning the present invention, the applicant asserts that because of the structure of the present invention, there is an unexpected result that "the processor does not poll for a status of the key cells during a time period between
30 any key cell being pressed and then released", and this unexpected result is a beneficial

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result because this feature increases the efficiency of the processor.

Examiner has further stated on page 5 of the Office Action dated September 17, 2007, that "applicant has not disclosed that this limitation [detecting a transient voltage
5 being greater than a reference voltage (e.g., going from 0v to 5v)] provides an advantage, is used for a particular purpose, or solves a stated problem." Applicant respectfully disagrees and notes that claim 7 of the present invention discloses "a detect circuit electrically connected to the output end of the key cell for detecting a transient voltage at the moment when the key cell is pressed or released and then generating a control signal"
10 (emphasis added). As stated by the applicant in the previous response to the Office Action (dated June 22, 2007), page 12, "neither Schnizlein nor Nakazawa teach designs that initiate a key discrimination process triggered by a control signal resulting from both key presses as well as key releases. The present invention is able to detect both key presses and key releases in the same circuit and operation." From the above and from the
15 disclosed description of the present invention, applicant has presented that detecting a transient voltage being greater than (as well as less than) the reference voltage allows the present invention to advantageously detect both key presses and key releases in the same circuit, and in turn (as mentioned above) permits further user key behavior and the aforementioned power consumption reduction.

20 For at least the above reasons, applicant asserts that 1, 7, and 16-22 should not be found obvious in view of the cited references. Dependent claims should be found for at least the same reasons. Reconsideration of claims 1-26 is respectfully requested.

Claims 2, 3 and 8-10 as rejected in Office Action dated September 17, 2007.

25 As mentioned above, claims 2, 3 and 8-10 are dependent upon claims 1 and 7, respectively, which are believed to be allowable for the above stated reasons. Therefore, claims 2, 3 and 8-10 should also be found allowable for the same reasons as their base claims.

30 Additionally, Examiner points out on page 6 of said Office Action that "it would have been obvious to a person of ordinary skill in the art to implement the at least one

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capacitor and amplifying circuit taught by Hackmeister into the keyboard taught by Nakazawa and Schnizlein". Applicant states that the function and purpose of the capacitor and amplifying circuit in the present invention are unnecessary in the keyboard taught by Nakazawa. Applicant therefore asserts it would not have been obvious to a person of
5 ordinary skill to implement unnecessary components into the keyboard taught by Nakazawa, and further points to notes mentioned in the response (dated June 22, 2007) to the previous Office Action (dated March 23, 2007), stating that "to add these unnecessary components would achieve no noticeable benefit" (page 14). Thus, applicant asserts there is no motivation to combine the teachings of Hackmeister with those of Nakazawa and
10 Schnizlein.

Claims 4-6, 11-15 and 23-25 as rejected in Office Action dated September 17, 2007.

As mentioned above, claims 4-6, 11-15 and 23-25 are dependent upon claims 1, 7, and 16-17, which are believed to be allowable for the above stated reasons. Therefore,
15 claims 4-6, 11-15 and 23-25 should also be found allowable for the same reasons as their base claims.

Claim 26 as rejected in Office Action dated September 17, 2007.

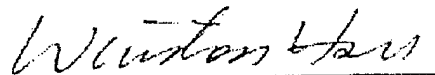
Examiner points to Wall disclosing a positive comparator for determining key
20 presses, and suggests "it would have been obvious to one skilled in the art to substitute one positive comparator for the other to achieve the predictable result of detecting a key depression based on the positive key voltage." While the result mentioned by the Examiner is also achieved in the present invention, applicant asserts that, again further to the response (dated June 22, 2007) to the previous Office Action (dated March 23, 2007),
25 the present invention also achieves the unexpected result of detecting both key presses and key releases in the same circuit without scanning or (i.e., the processor does not perform polling of the key circuits) during the time period between a key being pressed and released, reducing the aforementioned processor power consumption, increasing processor efficiency, and additionally permitting further user key behavior (such as N-key
30 rollover).

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Conclusion:

Thus, all pending claims are submitted to be in condition for allowance with respect to the cited art for at least the reasons presented above. The Examiner is encouraged to
5 telephone the undersigned if there are informalities that can be resolved in a phone conversation, or if the Examiner has any ideas or suggestions for further advancing the prosecution of this case.

10 Sincerely yours,



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Note: Please leave a message in my voice mail if you need to talk to me. (The time in
20 D.C. is 13 hours behind the Taiwan time, i.e. 9 AM in D.C. = 10 PM in Taiwan.)